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FORM PTO-1449 U.S. Department of Commerce
Patent and Trademark Office

Attorney Docket Number
5308-156

Serial No.
09/911,995

LIST OF DOCUMENTS CITED BY APPLICANT



(Use several sheets if necessary)

Applicants: Ryu, et al.

Filing Date: July 24, 2001

Group
2811

U. S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
B7K7H	1	5,506,421	4-9-96	Palmour	257	77

FOREIGN PATENT DOCUMENTS

Document Number	Date	Country	Class	Subclass	Translation Yes No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

B7K7H	2	M. K. Das, L.A. Lipkin, J.W. Palmour, G.Y. Chung, J.R. Williams, K. McDonald, and L.C. Feldman, "High Mobility 4H-SiC Inversion Mode MOSFETs Using Thermally Grown, NO Annealed SiO ₂ ," <i>IEEE Device Research Conference</i> , Denver, CO June 19-21, 2000.	✓
	3	G.Y. Chung, C.C. Tin, J.R. Williams, K. McDonald, R.A. Weller, S.T. Pantelides, L.C. Feldman, M.K. Das, and J.W. Palmour, "Improved Inversion Channel Mobility for 4H-SiC MOSFETs Following High Temperature Anneals in Nitric Oxide," <i>IEEE Electron Device Letters</i> accepted for publication.	
B7K7H	4	G.Y. Chung, C.C. Tin, J.R. Williams, K. McDonald, M. Di Ventra, S.T. Pantelides, L.C. Feldman, and R.A. Weller, "Effect of nitric oxide annealing on the interface trap densities near the band edges in 4H," <i>Applied Physics Letters</i> , Vol. 76, No. 13, pp.1713-1715, March 2000.	✓
	5	P.T. Lai, Supratik Chakraborty, C.L. Chan, and Y.C. Cheng, "Effects of nitridation and annealing on interface properties of thermally oxidized SiO ₂ /SiC metal-oxide-semiconductor system," <i>Applied Physics Letters</i> , Vol. 76, No. 25, pp. 3744-3746, June 2000.	✓
	6	J.P. Xu, P.T. Lai, C.L. Chan, B. Li, and Y.C. Cheng, "Improved Performance and Reliability of N ₂ O-Grown Oxynitride on 6H-SiC," <i>IEEE Electron Device Letters</i> , Vol. 21, No. 6, pp. 298-300, June 2000.	✓
	7	L.A. Lipkin and J.W. Palmour, "Low interface state density oxides on p-type SiC," <i>Materials Science Forum</i> Vols. 264-268, pp. 853-856, 1998.	✓
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	9	A.K. Agarwal, J.B. Casady, L.B. Rowland, W.F. Valek, and C.D. Brandt, "1400 V 4H-SiC Power MOSFET's," <i>Materials Science Forum</i> Vols. 264-268, pp.989-992, 1998.	✓
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	11	J.N. Shenoy, J.A. Cooper and M.R. Meelock, "High-Voltage Double-Implanted Power MOSFETs in 6H-SiC," <i>IEEE Electron Device Letters</i> , Vol. 18, No. 3, pp.93-95, March 1997.	✓
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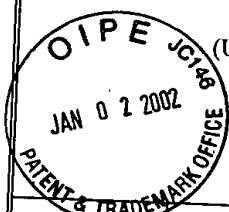
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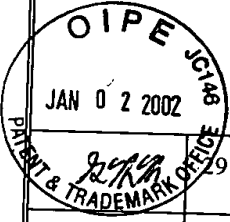
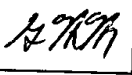
13	R. Schörner, P. Friedrichs, D. Peters, H. Mitlehner, B. Weis, and D. Stephani, "Rugged Power MOSFETs in 6H-SiC with Blocking Capability up to 1800 V," <i>Materials Science Forum</i> Vols. 338-342, pp. 1295-1298, 2000.	✓
14	V.R. Vathulya and M.H. White, "Characterization of Channel Mobility on Implanted SiC to Determine Polytype Suitability for the Power DIMOS Structure," <i>Electronic Materials Conference</i> , Santa Barbara, CA, June 30-July 2, 1999.	✓
15	A.V. Suvorov, L.A. Lipkin, G.M. Johnson, R. Singh and J.W. Palmour, "4H-SiC Self-Aligned Implant-Diffused Structure for Power DMOSFETs," <i>Materials Science Forum</i> Vols. 338-342, pp. 1275-1278, 2000.	✓
16	R. Schorner, P. Friedrichs, D. Peters, and D. Stephani, "Significantly Improved Performance of MOSFETs on Silicon Carbide Using the 15R-SiC Polytype," <i>IEEE Electron Device Letters</i> , Vol. 20, No. 5, pp.241-244, May 1999.	✓
17	S.T. Pantelides, "Atomic Scale Engineering of SiC Dielectric Interfaces," DARPA/MTO High Power and ONR Power Switching MURI Reviews, Rosslyn, VA, August 10-12, 1999.	✓
18	V.V. Afanas'ev, M. Bassler, G. Pensl, and M. Schulz, "Intrinsic SiC/SiO ₂ Interface States," <i>Phy. Stat. Sol. (a)</i> , Vol. 162, pp.321-337, 1997.	✓
19	S. Sridevan, P.K. McLarty, and B.J. Baliga, "On the Presence of Aluminum in Thermally Grown Oxides on 6H-Silicon Carbide," <i>IEEE Electron Device Letters</i> , Vol. 17, No. 3, pp. 136-138, March 1996.	✓
20	M.A. Capano, S.Ryu, J.A. Cooper, Jr., M.R. Melloch, K. Rottner, S. Karlsson, N. Nordell, A. Powell, and D.E. Walker, Jr., "Surface Roughening in Ion Implanted 4H-Silicon Carbide," <i>Journal of Electronic Materials</i> , Vol. 28, No. 3, pp. 214-218, March 1999.	✓
21	M.K. Das, J.A. Cooper, Jr., M.R. Melloch, and M.A. Capano, "Inversion Channel Mobility in 4H- and 6H-SiC MOSFETs," <i>IEEE Semiconductor Interface Specialists Conference</i> , San Diego, CA, December 3-5, 1998.	✓
22	P.M. Shenoy and B.J. Baliga, "The Planar 6H-SiC ACCUFET: A New High-Voltage Power MOSFET Structure," <i>IEEE Electron Device Letters</i> , Vol. 18, No. 12, pp. 589-591, December 1997.	✓
23	Ranbir Singh, Sei-Hyung Ryu and John W. Palmour, "High Temperature, High Current, 4H-SiC Accu-DMOSFET," <i>Materials Science Forum</i> Vols. 338-342, pp.1271-1274, 2000.	✓
24	Y. Wang, C. Weitzel, and M. Bhatnagar, "Accumulation-Mode SiC Power MOSFET Design Issues," <i>Materials Science Forum</i> , Vols. 338-342, pp.1287-1290.	✓
25	A.K. Agarwal, N.S. Saks, S.S. Mani, V.S. Hegde and P.A. Sanger, "Investigation of Lateral RESURF, 6H-SiC MOSFETs," <i>Materials Science Forum</i> , Vols. 338-342, pp. 1307-1310, 2000.	✓
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27	D. Alok, E. Arnold, and R. Egloff, "Process Dependence of Inversion Layer Mobility in 4H-SiC Devices," <i>Materials Science Forum</i> , Vols. 338-342, pp. 1077-1080, 2000.	✓
28	K. Ueno and Tadaaki Oikawa, "Counter-Doped MOSFET's of 4H-SiC." <i>IEEE Electron Device Letters</i> , Vol. 20, No. 12, pp. 624-626, December 1999.	✓

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FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)		Attorney Docket Number 5308-156	Serial No. 09/911,995
		Applicants: Ryu, et al.	
		Filing Date: July 24, 2001	Group 2811
	29	V. R. Vathulya, H. Shang, and M. H. White, "A Novel 6H-SiC Power DMOSFET with Implanted P-Well Spacer." <i>IEEE Electron Device Letters</i> , Vol. 20, No. 7, July 1999, pp. 354-356. ✓	
	30	A.K. Agarwal, S. Seshadri, and L. B. Rowland, "Temperature Dependence of Fowler-Nordheim Current in 6H- and 4H-SiC MOS Capacitors." <i>IEEE Electron Device Letters</i> , Vol. 18, No. 12, Dec. 1997, pp. 592-594. ✓	
	31	P. J. Tobin, Y. Okada, S. A. Ajuria, V. Lakhota, W. A. Feil, and R. I. Hedge, "Furnace formation of silicon oxynitride thin dielectrics in nitrous oxide (N ₂ O): The role of nitric oxide (NO)." <i>Journal of Applied Physics</i> . Vol. 75, No. 3, February 1, 1994, pp. 1811-1817. ✓	
	32	Sze, S.M. <i>Physics of Semiconductor Devices</i> , John Wiley & Sons, p. 383-390, (1981). ✓	
	33	H.F. Li, S. Dimitrijevic, H.B. Harrison, D. Sweatman, and P.T. Tanner. "Improving SiO ₂ Grown on P-Type 4H-SiC by NO Annealing." <i>Materials Science Forum</i> . Vols. 264-268 (1998) pp. 869-872. ✓	
	34	K. Ueno, R. Asai, and T. Tsuji. "4H-SiC MOSFET's Utilizing the H ₂ Surface Cleaning Technique." <i>IEEE Electron Device Letters</i> , Vol. 19, No. 7, July 1998, pp. 244-246. ✓	
	35	Chung et al. "The Effect of Si:C Source Ratio on SiO ₂ /SiC Interface State Density for Nitrogen Doped 4H and 6H-SiC," <i>Materials Science Forum</i> . (2000) Vols. 338-342, pp. 1097-1100. ✓	
	36	Pantelides et al. "Atomic-Scale Engineering of the SiC-SiO ₂ Interface," <i>Materials Science Forum</i> . (2000) Vols. 338-342, pp. 1133-1136.	
	37	Das, Mrinal K. Graduate thesis entitled, Fundamental Studies of the Silicon Carbide MOS Structure. Purdue University. No publication data ✓	

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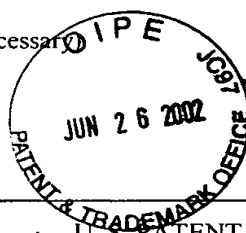
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U.S. PATENT DOCUMENTS							
Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
<i>R/K</i>	<i>4</i>	6,165,822	12/26/00	OKUNO ET AL	438	142	
<i>R/K</i>	<i>1</i>	6,096,607	8/1/00	Ueno	438	522	
<i>R/K</i>	<i>13</i>	6,221,700	4/24/01	OKUNO ET AL	438	157	
<i>R/K</i>	<i>2</i>	6,117,735	9/12/00	Ueno	438	268	
FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes No
<i>R/K</i>	<i>3</i>	DE 198 09 554	9/10/98	Germany ✓			Abstract
	<i>4</i>	<i>corresponds to 45 6,165,822</i> DE 19900171	12/26/00	Germany ✓			Abstract
<i>R/K</i>	<i>5</i>	DE 10036208	2/14/02	Germany ✓			Abstract
<i> </i>	<i>6</i>	JP 08264766	10/11/96	Japan ✓			Abstract
<i> </i>	<i>7</i>	JP 2000082812	3/21/00	Japan ✓			Abstract
<i> </i>	<i>8</i>	JP 11261061	9/24/99	Japan ✓			Abstract
<i> </i>	<i>9</i>	JP 11238742	8/31/99	Japan ✓			Abstract
<i> </i>	<i>10</i>	JP 11266017	9/28/99	Japan ✓			Abstract
<i> </i>	<i>11</i>	JP 11274487	10/8/99	Japan ✓			Abstract
<i>R/K</i>	<i>12</i>	JP 2000049167	2/18/00	Japan ✓			Abstract
	<i>13</i>	<i>corresponds to 45 6,221,700</i> JP 2000106371	4/11/00	Japan ✓			Abstract
<i>R/K</i>	<i>14</i>	JP 03157974	7/5/91	Japan ✓			Abstract
<i>R/K</i>	<i>15</i>	JP 09205202	8/5/97	Japan ✓			Abstract
<i>R/K</i>	<i>16</i>	JP 11191559	7/13/99	Japan ✓			Abstract
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
<i>R/K</i>	17	Chakraborty et al. "Interface Properties of N ₂ O-annealed SiO ₂ /SiC system," <i>Proceedings IEEE Hong Kong Electron Devices Meeting</i> . June 24, 2000, pp. 108-11. ✓					
<i>R/K</i>	18	Lipkin et al. "Insulator Investigation on SiC for Improved Reliability," <i>IEEE Transactions on Electron Devices</i> . Vol. 46, No. 3, March 1999, pp. 525-32. ✓					
<i>R/K</i>	19	Copy of International Search Report for PCT/US01/30715. ✓					

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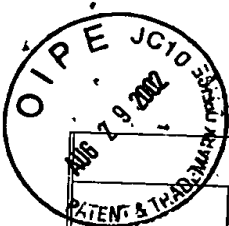
Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
<i>SKM</i>	1	3,924,024	12/2/75	Naber et al.	427	95	
	2	4,466,172	8/21/84	Batra	29	571	
	3	4,875,083	10/17/89	Palmour	357	23.6	
	4	5,170,455	12/8/92	Goossen et al.	385	89	
	5	5,184,199	2/2/93	Fujii et al.	29	10	
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	9	5,837,572	11/17/98	Gardner et al.	438	199	
	10	5,885,870A	3/99	Maiti et al.	438	261	
	11	5,939,763	8/17/99	Hao et al.	257	411	
	12	5,960,289	9/28/99	Tsui et al.	438	257	
	13	5,972,801	10/26/99	Lipkin et al.	438	770	
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	18	6,190,973 B1	2/20/01	Berg et al.	438	275	
	19	6,204,203	3/01	Narwanker et al.	438	785	
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	23	6,297,172	10/2/01	Kashiwagi	438	773	
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<i>SKM</i>	25	US200100558/ 52A1	12/01	Moise et al.	438	396	

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✓	27271	27	0 637 069 B1	1/31/01	EPO		
✓	27271	28	WO 97/17730	5/15/97	PCT		
✓	27271	29	WO 97/39485	10/23/97	PCT		

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✓	27271	30	Lipkin et al. "Challenges and State-of-the-Art Oxides in SiC," <i>Mat. Res. Soc. Symp. Proc.</i> Vol. 640, Nov. 2000, pp. 27-29.
✓	27271	31	Jamet, et al. "Physical properties of N ₂ O and NO-nitrided gate oxides grown on 4H SiC," <i>Applied Physics Letters</i> . Vol. 79, No.3, July 16, 2001, pp. 323-5.
✓	27271	32	International Search Report, PCT/US 01/42414, April 23, 2002, 10 pages.
✓	27271	33	Agarwal et al. "A Critical Look at the Performance Advantages and Limitations of 4H-SiC Power UMOSFET Structures," <i>1996 IEEE ISPSD and IC's Proc.</i> , May 20-23, 1996, pp. 119-122.

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